FRAGMENTATION CONTROL THROUGH THE ATTENUATION OF EXPLOSIVELY PRODUCED SHOCK WAVES

A.C. Torrance, S.B. Richardson and N.T. Moxon

BHP Central Research Laboratories
PO Box 188
Wallsend NSW 2287
Australia

ABSTRACT

In many mining situations the energy released by an explosive is far too high and results in over fragmentation and excessive damage to the surrounding strata. Laboratory experiments have demonstrated that the shock energy of an explosive can be significantly reduced by surrounding it with an attenuating material such as a foam. The effect of this reduction in shock energy on fragmentation has been determined using model materials. A four fold reduction in the amount of minus 8mm material relative to an air decoupled charge of the same weight was obtained for a foam attenuator.

The attenuation of explosively produced shock waves has an application in the following areas :

- optimizing fragmentation and reducing the portion of fine material
- limits control through the selective attenuation of shock waves behind the blast
- protection of coal seams and other structures within a mine.